COMMONWEALTH OF AUSTRALIA

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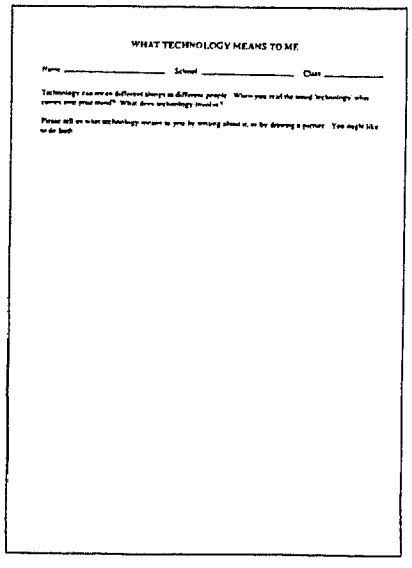
Warning

Section 2 The Writing/Drawing Activity

What is it?

The Writing/Drawing Activity has the following sentences printed at the top of a sheet of paper.

> *Technology can mean different things to different people. When you read the word 'technology' what comes into your mind? What does technology involve?*
>
> *Please tell us what technology means to you by writing about it, or by drawing a picture. You might like to do both.*


WHAT TECHNOLOGY MEANS TO ME

Name _____ School _____ Class _____

Technology can mean different things to different people. When you read the word 'technology' what comes into your mind? What does technology involve?

Please tell us what technology means to you by writing about it, or by drawing a picture. You might like to do both.

Where did the Writing/ Drawing Activity come from?

This idea was originally used as an essay topic by a group of technology educators in The Netherlands, led by Professor Jan Raat, together with Drs Ilja Mottier, Marc de Vries and Falco de Klerk Wolters. The Pupils' Attitudes Towards Technology (PATT) research provided the international educational community with much of the work done on pupils' understanding of technology during the last decade.

What is it for?

The Writing/Drawing Activity is designed for people, young and old, to give their ideas about technology. It has been used for children as young as Year 1 and also for adults. Of course, people may know a lot more than they write or draw, but they are likely to present their strongest images. Very young children sometimes don't have many ideas about technology, but they seem quite happy to draw a picture which appeals to them.

The Writing/Drawing Activity can be used to assess children's ideas about technology or as a way of helping them to think about and discuss their ideas.

How to use it

Important note: *Use the Writing/Drawing Activity BEFORE you use either the Picture Quiz or the Technology Questionnaire, otherwise the children may take their ideas from these other activities!*

1. Distribute a copy of the Writing/Drawing Activity to each child. (A photocopy master is at the back of the book, see page 52.)

2. If you think it is helpful, read the instructions to the class.

   Do not tell children what technology is, if they ask, just say that you would like them to give you their own ideas. Some children are afraid to start because they are afraid of getting it wrong. Encourage them to express their own ideas and assure them that their ideas are important. It is OK to write "I don't know".

3. Allow at least ten minutes for the children to respond.

   Ideally, children should write or draw for as long as they wish, but some will be slow to start, some will finish quickly, and some will want to write or draw for a long time. Teachers should decide how long is necessary.

What results can be expected?

The responses are often fascinating, and enormously varied. Some children simply draw a computer. Some draw a space ship. Others may write a full page essay about ideas like inventing, technology in the past, technology helping people, but also creating problems like pollution. Some may give examples of several technological products and processes as well. Pages 13 and 14 have some samples of children's responses.

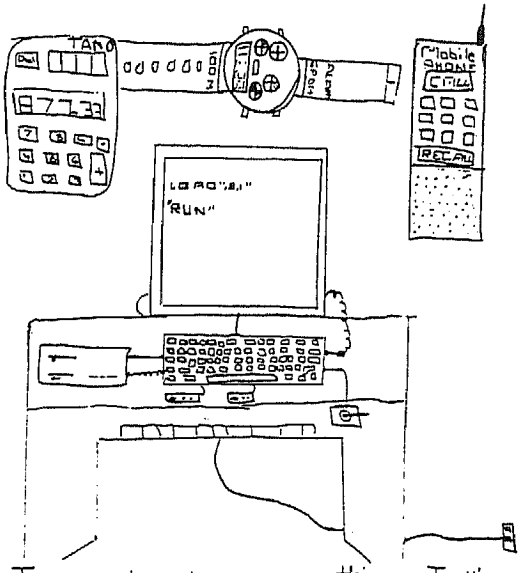
Based on the many responses collected from the Writing/Drawing Activity (and a lot of discussion with teachers), a summary sheet has been developed to sort the responses into categories to help make sense of them. This summary sheet appears on page 12 as Table 1. There are ten main categories covering all kinds of responses that children may make, including categories for incorrect ideas, like natural phenomena. Another category deals with attitudes about technology, such as its importance or effects. The children's responses on pages 13 and 14 include some comments about the categories the responses include.

Table 1
A Summary Sheet for Children's Responses to the Writing/Drawing Activity

Main Category	Description of Category	Examples
0. Human Element	Included humans in response	person driving car
1. Non-Technological	Plants/animals	kangaroo, parrot
	Space (excluding space travel)	stars, planets
	Natural phenomena	trees and hills
2. Art	Art products	painting, statue
	Music	guitar
	Theatre Arts	drama or play
3. Concept of change	Early technology	things labelled "old"
	Keeping up-to date/ modernising	things labelled "new"
	Futuristic	space travel
4. Biological Technology	Human intervention in life, including Horticulture and animal husbandry	Plants and animals which are bred
5. Products	Processed food	coffee, hamburger
	Textiles, graphic media	paper, book
	Furniture/utensils	screwdriver, chair
	General machinery	reference to machines
	Electrical appliances	TV, reference to power
	Computers	robots, video games
	Vehicles and transport	cars, planes,
	Telephones and communication	satellite dish
	Weapons	bombs
6. Industrial Processes	Primary, secondary and tertiary industry (including health issues)	reference to "making things", manufacture,
	General work-related ideas	"human-made"
7. Buildings, Environments	Buildings, houses	building things
	Parks, roads	
8. Design Process	Ideas and inventions	creating, inventing
	Research & development, marketing	testing, designing
	Making models	lego, class models
9. Knowledge	General knowledge or learning	study, finding out
	Science-related knowledge	scientist, experiments
10. Affective reactions to technology	Attitudes, like interesting, complex, important, difficult	clever things, experts
	Positive consequences	helps people, useful
	Negative consequences	pollution, lost jobs
	Diversity; technology is many things	many examples given

Technology is hard to explain but I am sure I know what it means. Technology is actualy how people keep designing different things. computers are part of technology and time also take part in technology. for instance many years ago we had not inverted computers, the wheel, or any mechanical things but over time we build one thing and that leads to another because we are not satisfied with it. this happened for a long time (and is still happens) until we are here today.

This Year 7 girl understands technology as a design process and has a good idea about its historical aspects and that it satisfies human needs. The response would score in the categories: concept of change, general machinery, computers, research and development, diversity, and of course, the human element is included.



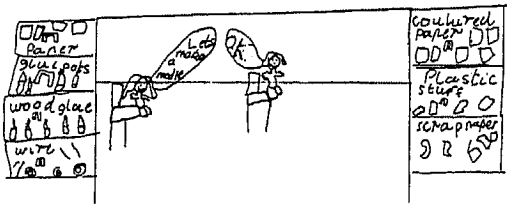
Tecnology involves many things I think it is great

This Year 6 boy has a positive and essentially product-orientated view of technology. The drawing has electrical appliances, computer, telephone, positive consequences and understanding of the diversity of technology.

Technology is new inventions or thing that help make tasks easy.

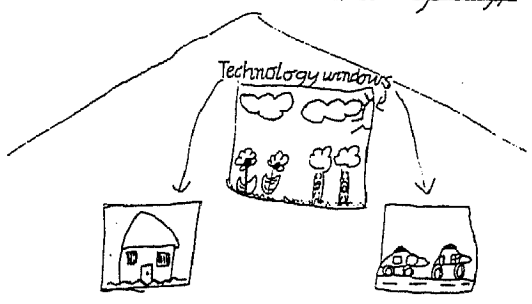
This short response from a Year 6 boy indicates understanding of invention and purpose. It would score in the categories: concept of change, ideas and inventions, positive consequences and diversity.

I think tecnology is making models and other sorts of things.

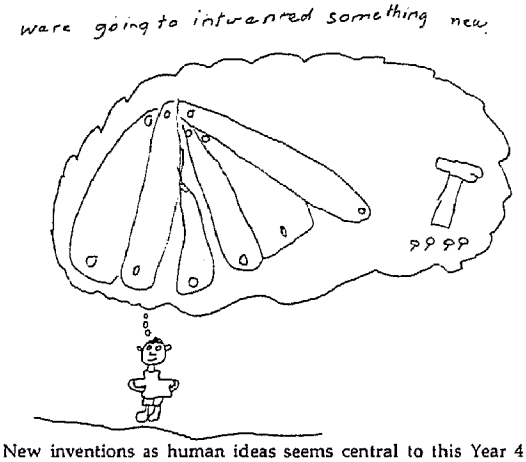


This Year 3 girl views technology as making models, and has drawn the raw materials for making them.

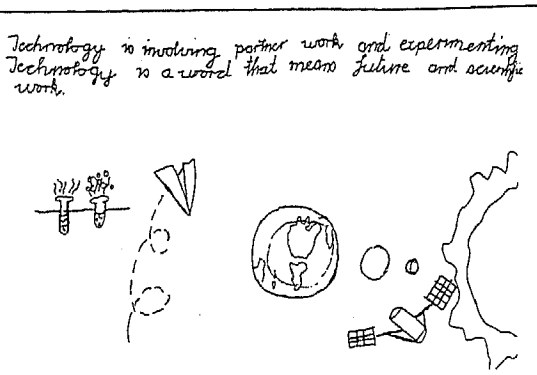
I think technology is about making the land better and about making things



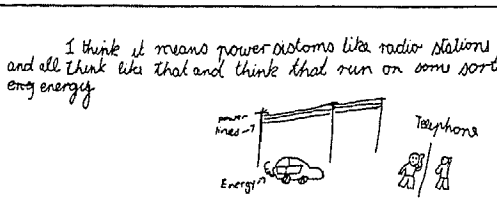
This Year 3 boy has included reference to "making the land better" and making things, such as buildings and vehicles. His drawing looks more like landscaping than agriculture, so the categories include vehicles, secondary industry, buildings and environments, and positive consequences.



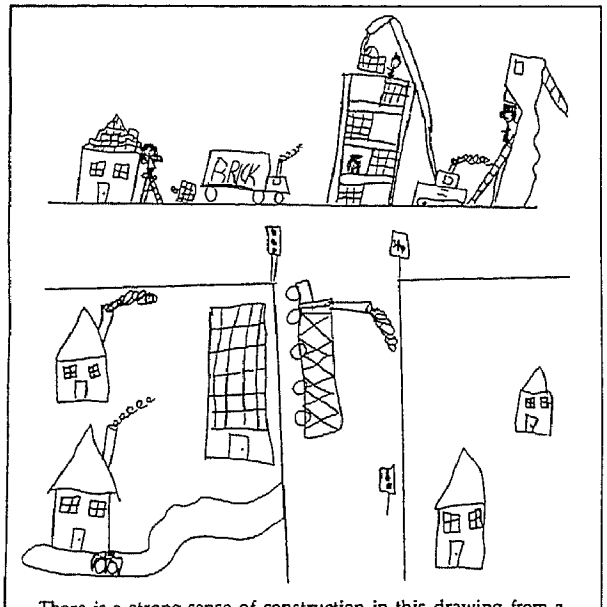
New inventions as human ideas seems central to this Year 4 boy's idea about technology. There appears to be tools (hammer and nails) to make the new invention and teachers might consider this response to include model-making. Judgements about children's responses can be rather subjective, as this drawing demonstrates.



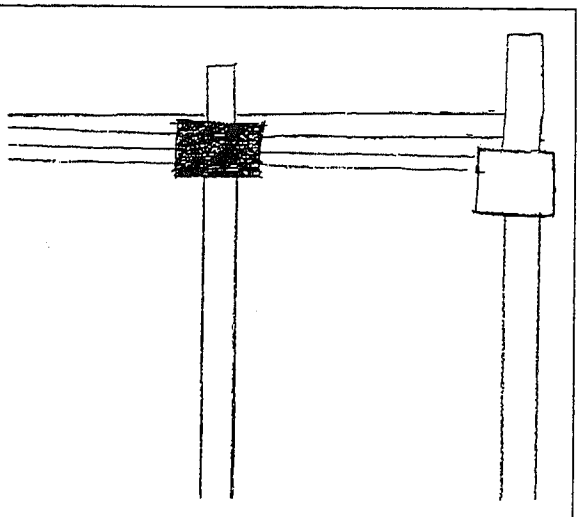
There are several ideas about technology in this Year 5 boy's response. He first refers to working with a partner (the human element) to do experiments (presumably at school) and doing scientific work, which is categorised as science-related knowledge. The next idea is about the future and he has drawn items suggesting satellite communication, so these would fit into the categories of change and communication. It is not altogether clear where the paper plane fits into this response!



This Year 5 girl has power and energy and the things that use them as her definition of technology. Categories represented are humans, electrical appliances, vehicles and telephones.



There is a strong sense of construction in this drawing from a Year 4 girl. The attempt at a plan drawing is unusual. The categories include the human element, buildings, industrial processes and transport.



This drawing of power lines from a Year 2 child represents a common view of technology as power and/or electricity.

What to do with the results

1. *Read them through.*

   Common patterns often emerge.

   - Children may present the view that technology involves only computers, mobile phones and other modern electrical appliances. This view is very common.
   - Often children leave out any reference to humans in their response, suggesting that they do not recognise the social aspects of technology.
   - There may be a dominant (and incorrect) view that technology is the same as science.
   - In a country like England, where design and technology has been part of the curriculum for some time, children frequently draw a picture or write about making models.
   - It may be that no pattern is apparent. Teachers may then wish to use the summary sheet to categorise and count children's responses to help find a pattern.

2. *Categorise, code and count.*

   A summary sheet based on Table 1 (see page 12) will help you to categorise and count children's responses. (There is a photocopy master at the back of the book on page 53.)

   - Use one summary sheet for the whole class.
   - Inspect the first writing or drawing response. Put a tally mark in the summary sheet against any category which the child includes. Only mark each category once, even if the child has given several examples of a similar thing. For example, a TV, walkman, CD player and microwave will count only once as "electrical appliances". Obviously a child whose writing or drawing contains many ideas may receive several tally marks.
   - Continue to do this for every child's writing or drawing response.

3. *Find the pattern.*

   When a summary sheet is completed for the class, the frequency of the tally marks will show the ideas most often associated with technology, and those things which were not considered at all. Some summary sheets, compiled using data from actual classes, are given as examples on page 16 with an interpretation of their patterns.

   Teachers may find it easier to use just the ten main categories to find the pattern in children's responses. This will still give a useful summary of the children's ideas.

These results come from a Year 7 class with a strong view of technology as modern, electrical products.

Main Category	Examples of Category	Tallies	
0. Human Element	Included humans in response	𝍸 𝍸 III 𝍸 𝍸 𝍸	56%
1. Non-Technological	Plants/animals Space (excluding space travel) Natural phenomena	—	
2. Art	Art products Music, Theatre Arts	𝍸 II 𝍸 𝍸	
3. Concept of change	Early technology Keeping up-to date/ modernizing Futuristic	𝍸 III 𝍸 𝍸	56%
4. Biological Technology	Human intervention in life, including Horticulture and animal husbandry	—	
5. Products	Processed food Textiles, graphic media Furniture/utensils	—	
	General machinery	III 𝍸	25%
	Electrical appliances	𝍸 𝍸 IIII	14%
	Computers	𝍸 I 𝍸 𝍸	50%
	Vehicles and transport	III 𝍸	25%
	Telephones and communication	II	6%
	Weapons	II	6%
6. Industrial Processes	Primary, secondary and tertiary industry (including health issues) General work-related ideas	𝍸	13%
7. Buildings, Environments	Buildings, houses Parks, roads	II	6%
8. Design Process	Ideas and inventions	II	6%
	Research & development, marketing	I 𝍸	19%
	Making models	II	6%
9. Knowledge	General knowledge or learning	II	6%
	Science-related knowledge	𝍸 𝍸	31%
10. Affective reactions to technology	Attitudes, like interesting, complex, important, difficult	—	
	Positive consequences	III 𝍸	25%
	Negative consequences		
	Diversity; technology is many things	I 𝍸	19%

Main Category	Examples of Category	Tallies	
0. Human Element	Included humans in response	𝍸 𝍸 𝍸 𝍸 IIII	89%
1. Non-Technological	Plants/animals Space (excluding space travel) Natural phenomena	—	
2. Art	Art products Music, Theatre Arts	—	
3. Concept of change	Early technology Keeping up-to date/ modernizing Futuristic	I	4%
4. Biological Technology	Human intervention in life, including Horticulture and animal husbandry	—	
5. Products	Processed food Textiles, graphic media Furniture/utensils	I	4%
	General machinery	I	4%
	Electrical appliances	I	4%
	Computers	I	4%
	Vehicles and transport	—	
	Telephones and communication	—	
	Weapons	—	
6. Industrial Processes	Primary, secondary and tertiary industry (including health issues) General work-related ideas	III	11%
7. Buildings, Environments	Buildings, houses Parks, roads	II	7%
8. Design Process	Ideas and inventions	𝍸 IIII 𝍸 𝍸	70%
	Research & development, marketing	𝍸 II 𝍸 𝍸	63%
	Making models	𝍸 𝍸 III 𝍸 𝍸	67%
9. Knowledge	General knowledge or learning	I	4%
	Science-related knowledge	II	7%
10. Affective reactions to technology	Attitudes, like interesting, complex, important, difficult	𝍸 𝍸 𝍸 III	48%
	Positive consequences	II	7%
	Negative consequences	—	
	Diversity; technology is many things	III	11%

These results come from a Year 6 class which has been working with technology as a design process, and this is reflected in the results.

WRITING/DRAWING ABOUT TECHNOLOGY *SUMMARY SHEET*

School 17 Schools in WA Class/Room Yr 2 – 7

The table describes the kind of things that children draw or write about technology. Each category is coded only once per child, even if several items in the same category are mentioned.

Main Category	Examples of Category	Tallies
0. Human Element	Included humans in response	42 %
1. Non-Technological	Plants/animals Space (excluding space travel) Natural phenomena	3 %
2. Art	Art products Music, Theatre Arts	< 1 %
3. Concept of change	Early technology Keeping up-to date/ modernizing Futuristic	21 %
4. Biological Technology	Human intervention in life, including Horticulture and animal husbandry	< 1 %
5. Products	Processed food Textiles, graphic media Furniture/utensils	4 %
	General machinery	21 %
	Electrical appliances	32 %
	Computers	33 %
	Vehicles and transport	22 %
	Telephones and communication	5 %
	Weapons	2 %
6. Industrial Processes	Primary, secondary and tertiary industry (including health issues) General work-related ideas	17 %
7. Buildings, Environments	Buildings, houses Parks, roads	4 %
8. Design Process	Ideas and inventions	14 %
	Research & development, marketing	9 %
	Making models	11 %
9. Knowledge	General knowledge or learning	12 %
	Science-related knowledge	19 %
10. Affective reactions to technology	Attitudes, like interesting, complex, important, difficult	9 %
	Positive consequences	12 %
	Negative consequences	1 %
	Diversity; technology is many things	12 %

The summary sheet above reports the results for around 1600 Western Australian children from Years 2 to 7. It gives a general overview of children's ideas about technology. The numbers give the percentage of all children responding in each category. For example, 42%, less than half of the children, have referred to humans in their responses. Many refer to electrical products, machinery and vehicles. A significant proportion confuse technology with learning or science. More children refer to positive benefits from technology than negative consequences.

What to do next

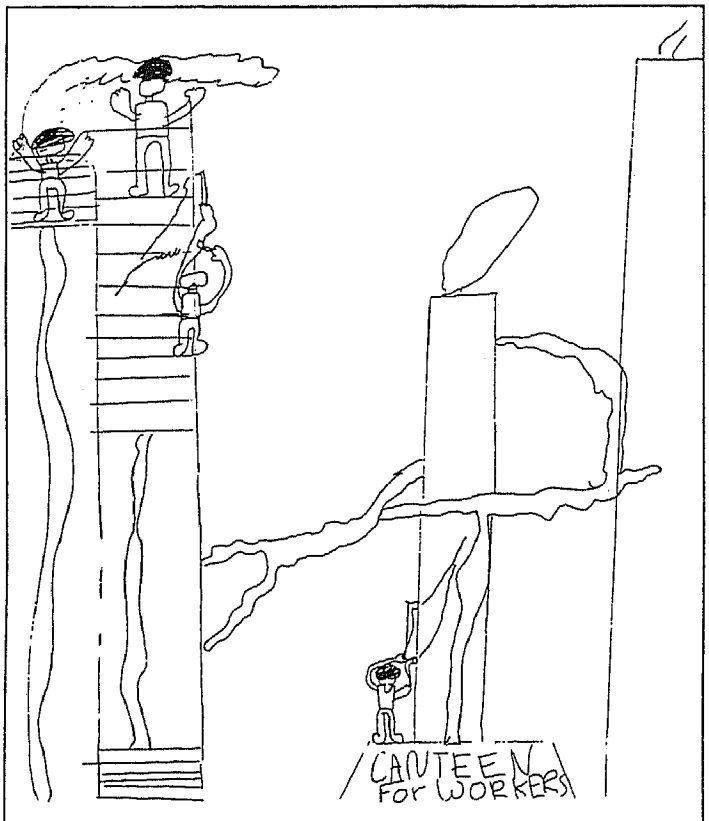
After the evidence has been gathered, teachers can decide what to do next. Usually there are three possibilities.

- If the class has a good understanding about technology, teachers may wish only to return their response sheets to the children and discuss them in class.

- There may be evidence of a very narrow, incomplete view of technology. Teachers may decide that some activities to broaden children's views are required.

- It may be clear that some children have incorrect ideas. This may interfere with their understanding in other lessons, and help is needed to change these ideas.

Teachers will now be ready to set their goals for action. Suggestions for class activities to achieve these goals are given in Section 5, beginning on page 31.



This unusual drawing from a Year 4 boy seems to show people working on factory chimneys. It would be important to talk to him to understand his ideas more fully.